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| 09/824,512 | 04/02/2001 | John S. Perry | 1657.48US01 | 1115 |
| 24113 | 7590 | 12/03/2004 | EXAMINER | |
| PATTERSON, THUENTE, SKAAR & CHRISTENSEN, P.A. 4800 IDS CENTER 80 SOUTH 8TH STREET MINNEAPOLIS, MN 55402-2100 | | | SAADAT, CAMERON | |
| | | ART UNIT | | PAPER NUMBER |
| | | 3713 | | |

DATE MAILED: 12/03/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|----------------------------|---------------------|--|
| Office Action Summary | Application No. | Applicant(s) | |
| | 09/824,512 | PERRY, JOHN S. | |
| | Examiner Cameron Saadat | Art Unit 3713 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) Responsive to communication(s) filed on 9/13/2004.
 2a) This action is FINAL. 2b) This action is non-final.
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) Claim(s) 1-20 is/are pending in the application.
 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
 5) Claim(s) _____ is/are allowed.
 6) Claim(s) 1-20 is/are rejected.
 7) Claim(s) _____ is/are objected to.
 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) The specification is objected to by the Examiner.
 10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

| | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____ | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 9/13/2004 has been entered. Claims 1-20 are pending in this application.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1-6 and 11-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dubin “High Performance Computing Workshop – Integrating Modeling and Simulation into the US Army Operational Test and Evaluation Process” in view of Uchihira (USPN 6,067,415).

Regarding claim 1, Dubin discloses an evaluation simulation system for a weapon system having at least one munitions element comprising: a computer system programmed to implement a causal network model comprising a collection of analysis models including at least one dynamic parameter (See P. 3; Figs. 1-2), for creating a virtual representation of the weapon system; at least one virtual simulation

system coupled to a causal network model to simulate the weapon system, including a simulation of a lethality of the munitions element (See P. 7); a user interface coupled to at least said computer system to selectively input data into said causal network model and receive information from said causal network model and said virtual simulation system (See Fig. 1; P. 5).

Regarding claim 16, Dubin discloses an integrated evaluation and simulation computer system for allocating resources across a system architecture of a weapon system having at least one munitions element to optimize a combat effectiveness of said weapon system, said computer system comprising: means for inputting data into and receiving information from said computer system; means for distributing data and information between said computer system and at least one virtual simulation system; and means for creating a virtual representation of an optimally effective weapon system based on a causal network model of said weapon system (See P. 3, 5, 7; Figs 1-2, 5-6).

Regarding claim 17, Dubin discloses a method of integrated evaluation and simulation for allocating resources across a system architecture of a weapon system having at least one munitions element to optimize a combat effectiveness of said weapon system, said method comprising the steps of: providing a computer system having a user interface and a causal network model; providing a virtual simulation system; selectively inputting data into said causal network model to create a virtual representation of an optimally effective weapon system; selectively running said virtual representation of said optimally effective weapon system in said virtual simulation system; and utilizing information to enhance said virtual representation of said optimally effective weapon system (See P. 3, 5, 7; Figs 1-2, 5-6).

Regarding claim 18, Dubin discloses, a computer-readable storage media storing at least one computer program that operates as an integrated performance simulator for allocating resources across a system architecture of a weapon system having at least one munitions element to optimize a combat effectiveness of said weapon system, said program comprising the steps of: storing a causal network

model of said weapon system in said computer system; obtaining data necessary for said program to create a virtual representation of an optimally effective weapon system; pulsing said causal network model to create said virtual representation of said optimally effective weapon system; selectively sending said virtual representation to a virtual simulation system for simulating weapon system operations; and receiving information about the performance of said weapons system (See P. 3, 5, 7; Figs 1-2, 5-6).

Regarding claim 19, Dubin discloses an integrated evaluation and simulation system for a weapon system having at least one munitions element, comprising: a computer system programmed to implement a causal network model comprising an integrated collection of analysis models for creating a virtual representation of a weapon system and to implement a means to communicate with a virtual simulation system; and a user interface operably coupled to at least said computer system to selectively input data into said causal network model and receive information from said causal network model and said virtual simulation system (See P. 3, 5, 7; Figs 1-2, 5-6).

Regarding claim 20, Dubin discloses an integrated evaluation and simulation system for a weapon system having at least one munitions element, comprising: a computer system programmed to implement a causal network model comprising an integrated collection of analysis models for creating a virtual representation of a weapon system; and a user interface operably coupled to said computer system to selectively input data into and receive information from said causal network model (See P. 3, 5, 7; Figs 1-2, 5-6).

Dubin discloses all of the claimed subject matter of claims 1 and 16-20 with the exception of explicitly disclosing that the causal parameters, of the weapon simulation and evaluation system, are represented by *nodes*. However, Uchihira discloses a programming support system wherein parameters of a computer program are represented by nodes and branches in a state transition diagram (Col. 3, line 57- Col. 4, line 9). Hence, in view of Uchihira, it would have been obvious to one of ordinary skill in

the art to modify the parameters of the weapon simulation and evaluation system described in Dubin, by utilizing a programming support system that represents parameters in the form of *nodes*, in order to allow a program designer to create a program which performs a desired behavior by specifying execution sequences in an execution path (scenario), showing all the possible execution sequences of each section of a process, thereby allowing the program designer to efficiently create, test, and debug a concurrent program in which a plurality of processes are executed concurrently.

Regarding claim 2, Dubin discloses a simulation system comprising an operation simulator to simulate operations of the weapon system; and an effectiveness simulator to evaluate the effectiveness of the weapon system in a simulated operational environment (See P. 3).

Regarding claim 3, Dubin discloses a simulation system, wherein the computer system further comprises a control system coupled to said causal network model to control operation of the causal network model in accordance with one of a plurality of modes of operation (P. 7).

Regarding claim 4, Dubin discloses a simulation system, wherein the control system operates the causal network model in an optimization mode (See Fig. 1).

Regarding claim 5, Dubin discloses a simulation system, wherein the causal network model performs a sensitivity analysis between an operational performance of the weapon system and an operational performance of a selected attribute of the weapon system (See P. 7).

Regarding claim 6, Dubin discloses a simulation system, wherein the control system includes an optimization routine that optimizes allocation of one or more selected constrained resources or design of one or more attributes of the weapon system by utilizing a causal network model (See P. 3; Figs. 1-2).

Regarding claim 11, Dubin discloses an evaluation simulation system for a weapon system wherein the user interface displays data in a modular configuration of tables associated with one of a plurality of components or attributes of a weapon system (See Fig. 6).

Referring to claim 12, Dubin discloses a simulation system for a weapon system wherein a causal network model communicates with a virtual simulation system via a series of data arrays (See Fig. 5).

Regarding claim 13, Dubin discloses a simulation system for a weapon system wherein the simulation system is an accredited ground wars simulation model (See P. 2)

Regarding claim 14, Dubin discloses an evaluation simulation system for a weapon system wherein a causal network model includes a relational database to store data that define at least one interrelationship between a plurality of parameters of the causal network model or an operational performance and at least one parameter of the causal network model (See P. 3, 5, 7; Figs 1-2, 5-6).

Regarding claim 15, Dubin discloses an evaluation simulation system for a weapon system wherein said causal network model has a modular implementation and each module is represented by a separate subroutine (See P. 3-5).

Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Dubin “High Performance Computing Workshop – Integrating Modeling and Simulation into the US Army Operational Test and Evaluation Process” in view of Uchihira (USPN 6,067,415), further in view of Allred “A/I Supervisor for F-4 Weapon Coefficient Optimization”.

Regarding claim 7, the combination of Dubin and Uchihira discloses all of the claimed subject matter with the exception of disclosing a control system that implements a *gradient search methodology*. However, Allred teaches a software tool comprising a gradient search methodology to optimize coefficients of a weapon system (See P. 360). Thus, in view of Allred, it would have been obvious to one of ordinary skill in the art to modify the optimization routine described in Dubin, by providing a gradient search methodology to avoid the fatal flaw of instability, which occurs during a non-linear approach of providing an optimization routine.

Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Dubin “High Performance Computing Workshop – Integrating Modeling and Simulation into the US Army

Operational Test and Evaluation Process” in view of Uchihira (USPN 6,067,415), further in view of Nakajima (U.S. Patent No. 6,411,945).

Regarding claim 8, the combination of Dubin and Uchihira discloses a simulation system wherein the optimization routine optimizes allocation of a cost of the weapon system (See Dubin, Fig. 2). Dubin and Uchihira do not explicitly disclose an optimization routine directed towards weight. However, Nakajima teaches an optimization routine comprising cost and weight constraints (column 10, lines 29-35). Hence, in view of Nakajima, it would have been obvious to one of ordinary skill in the art to modify the optimization routine described in Dubin, by providing cost and weight constraints, thereby minimizing the size and weight of military equipment while maintaining a cost-effective product.

Claims 9-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dubin “High Performance Computing Workshop – Integrating Modeling and Simulation into the US Army Operational Test and Evaluation Process” in view of Uchihira (USPN 6,067,415), further in view of Carico “Flight Test Automation using High Performance Computing”.

Regarding claim 9-10, the combination of Dubin and Uchihira discloses all of the claimed subject matter with the exception of explicitly disclosing a user interface having a menu driven graphical user interface. However, Carico discloses a test and evaluation system comprising a menu-driven graphical user interface (See P. 4, Fig. 1). Hence, in view of Carico, it would have been obvious to an artisan to modify the interface for inputting data as described in Dubin and Uchihira, by providing a menu-driven graphical user interface, in order to allow one to select the model complexity level and readily change model parameters (See Carico, P. 3).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Cameron Saadat whose telephone number is 571-272-4443. The examiner can normally be reached on M-F 9:00 - 6:00.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Xuan Thai can be reached on 571-272-7147. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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TC3700